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The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE.

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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No. 2467.—VOL. LII.

LONDON, SATURDAY, DECEMBER 2, 1882.

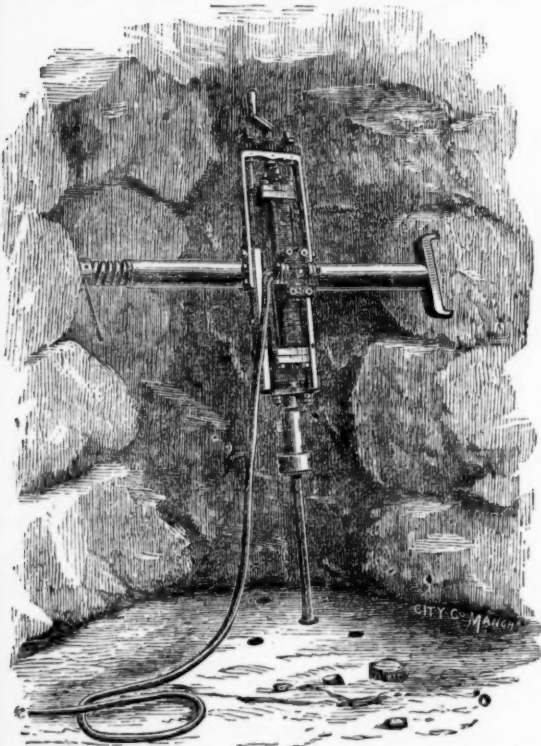
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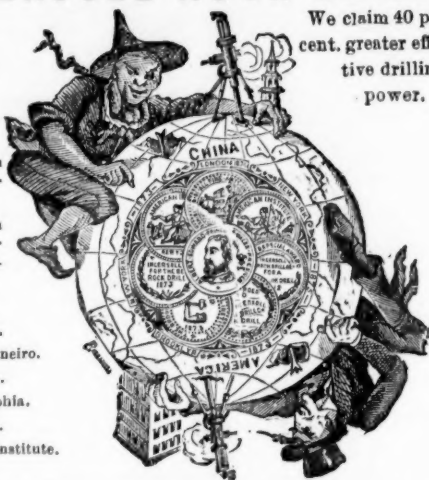
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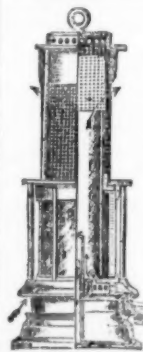
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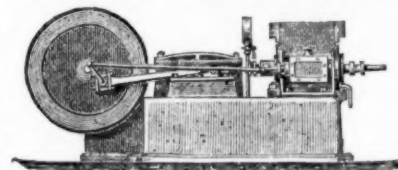
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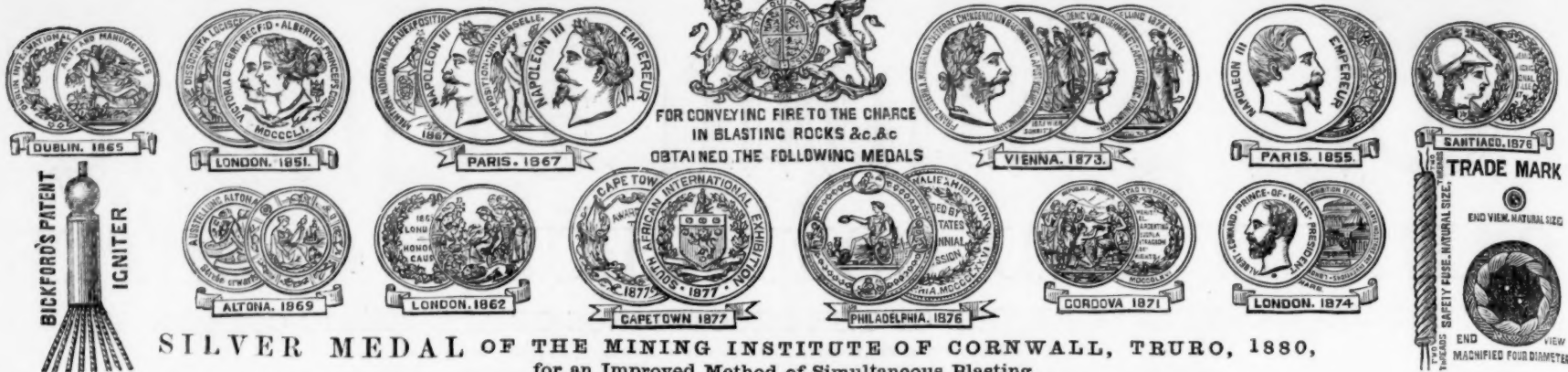
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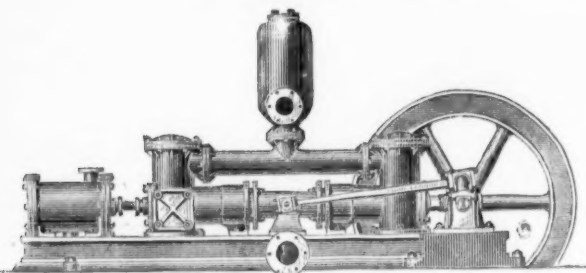
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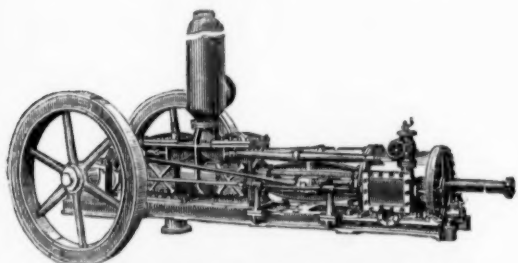


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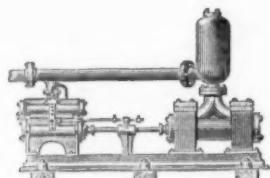
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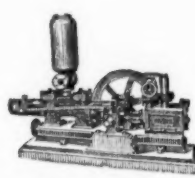
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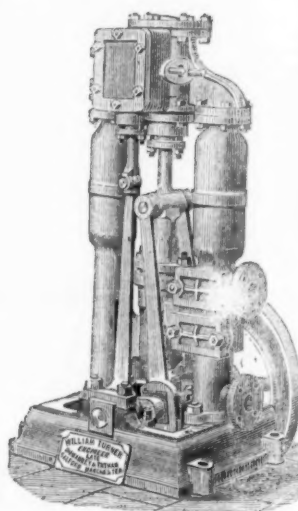
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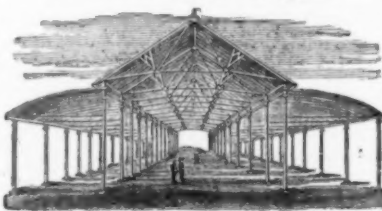
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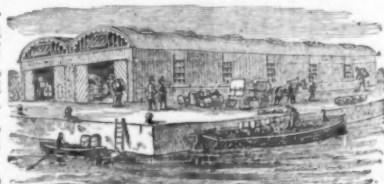
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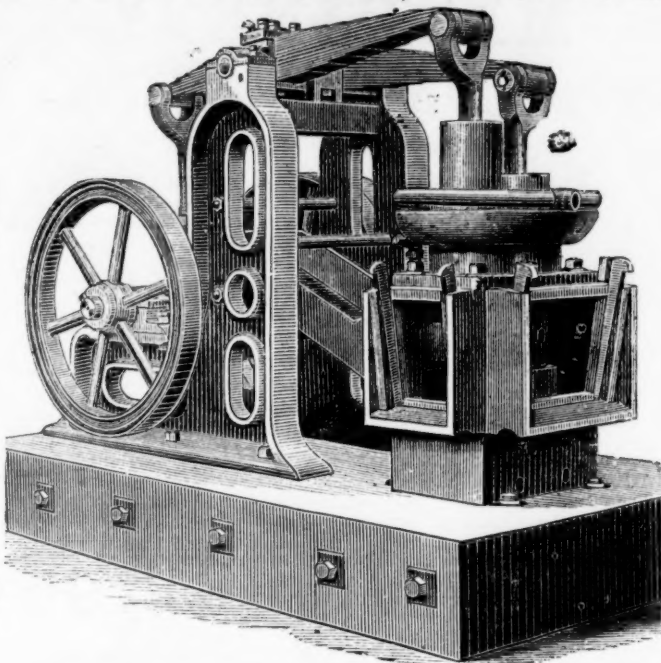
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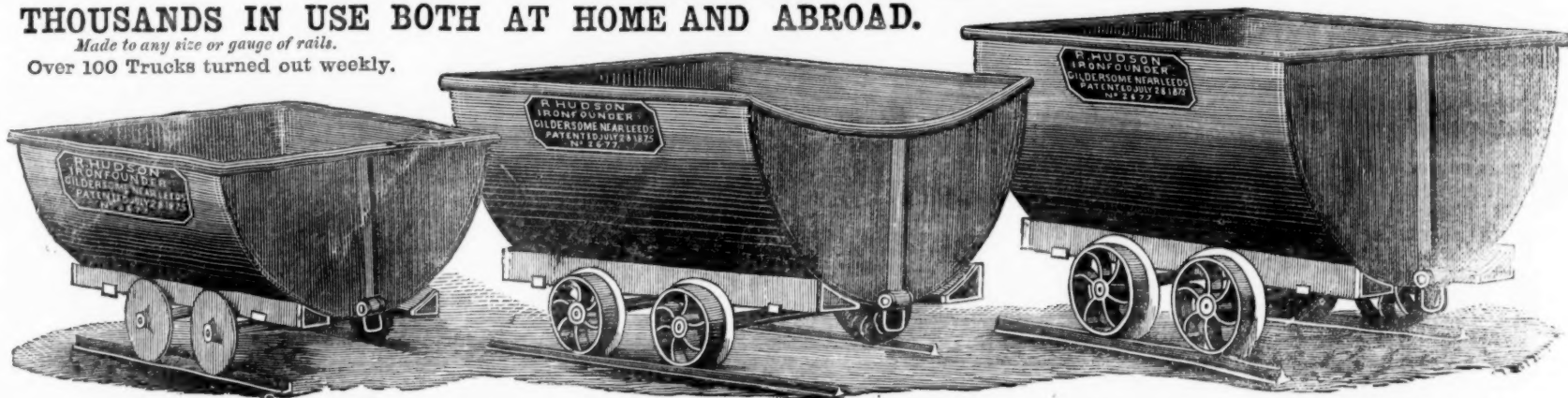
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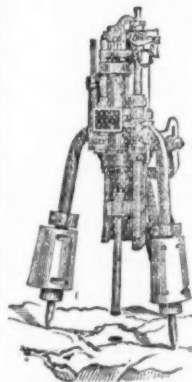
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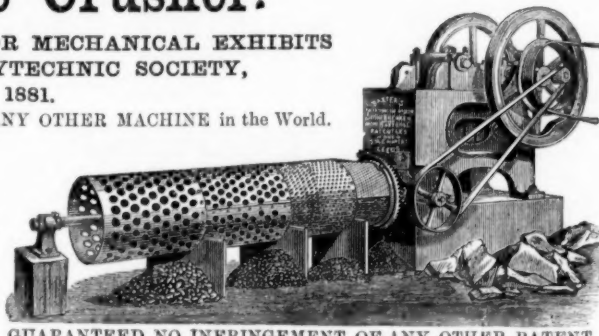
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ANTI-CORROSION TUBES AND FITTINGS COATED BY FARREY'S RUSTLESS PROCESS.

Original Correspondence.

SPANISH NATIONAL EXHIBITION OF MINERALOGY AND METALLURGY.

SIR,—The Ministry of Public Works at Madrid having issued the Royal Decree and Regulations for this Exhibition, the publication in the *Mining Journal* of the subjoined translation from the said regulations will, I trust, be of use to intending exhibitors as well as to those in general who take interest in so important branches of industrial enterprise, especially in a country of such mineral wealth as Spain.

1.—The Exhibition will be held in the Park at Madrid; it will be opened on April 1, and closed on June 30, 1883, subject, nevertheless, to such prorogations as His Majesty's Government may think fit.

2.—Mineral and metallurgical products, mineral waters, engines, tools, machines, and apparatus, are admissible up to Feb. 15, 1883.

3.—Intending exhibitors of machinery of all kinds, as well as those who wish to have their exhibit in private or special installations, must demand space for same before Oct. 31, 1882. All other exhibitors, those of machinery excepted, who wish space in the main gallery must petition for same before Dec. 31.

4.—In this Exhibition shall be admitted all such machinery, apparatus, utensils, tools (whether national or foreign), as have application to mining and metallurgy, earthenware and glass making, and the utilisation of mineral waters, also the products of foreign manufactures whose proprietors prove authentically that the said products have been manufactured exclusively of Spanish minerals.

5.—Exhibitors will be allowed gratis as well within the main gallery as outside thereof the space or ground required for their exhibits or machines. In the main gallery they will be allowed moreover, gratis, the show-glass fixtures, and fossils, objects of glass or earthenware manufacture, mineral waters, and books. The installation work required for same shall be at the expense of the exhibitor, but the water for steam-boilers and hydraulic machinery when not in excessive quantity shall be allowed gratis. When steam power exceeding that of 5-horse (up to which it will be gratis) may be needed, the owners of the machinery will pay 6d. per horse-power per hour. Special arrangements may, however, be made respecting the use, on a large scale, of steam or water for the trial or showing at work of machinery or apparatus.

6.—Exhibitors shall enjoy the privileges of carriage which foreign and Spanish companies have conceded for goods coming to the Exhibition at reduced rates. The expenses between the Madrid railway stations and the premises of the Exhibition, and loading and unloading of goods, shall be paid by the exhibitors or their agents.

7.—Foreign exhibitors or manufacturers who may have to remove or export again the goods exhibited shall enjoy in such case all the advantages allowed by Chap. IX. of the Customs regulations, in which it is provided:—

(a).—The Government Commissioner or the President of the official commission may have charge of the organisation of the Exhibition, or the respective representatives duly authorised, shall present to the Custom House of Entrance Declarations, in the form established for the importation of traffic, indicating the names of the exhibitors or proprietors of the articles or goods that may be introduced for the Exhibition. They will also present a bond in guarantee for the duty in case the goods be not exported again within the term fixed therefor; the said term will be three months after the closing of the Exhibition.

(b).—The goods may be exported again through the same Custom House or any other; in the latter case the administration will require from the office through which the importation took place an exact copy of the entrance declaration in order to compare the same with that of clearance, advising this operation for cancellation of bond. The goods not exported within the term fixed, or the difference in default, as found at Custom House of Clearance, shall pay duty as per Customs' tariff.

I shall be glad to attend to foreign exhibitors in any way they may require my services.

(Prof.) SANTIAGO TRAYNOR,

Delegate for the Royal Commission in the District of Híndelencina.

Nov. 20.

NEW ZEALAND AND IRELAND—A STRIKING COINCIDENCE.

SIR,—In reading an interesting description of the Geology of the Thames Gold Field, Auckland, by an able writer in the *New Zealand Herald*, received last mail, I was forcibly struck with, I may say, the identical character of the rock formation of the Thames gold field and a certain mountain district with which I am well acquainted in West Cork. To give the able article in *extenso* would, I fear, occupy too much of your space; I will, therefore, with your permission, give a few extracts, and also a short description of the district in West Cork; and if "like produces like" we have the precious metal in Ireland as well as in New Zealand. The writer says:—

The principal topographical features of that portion of the Thames gold field where the richest deposits of the precious metal have been found consist of irregularly formed hills, and form part of the extensive mountainous formations which traverse the entire length of the Thames peninsula. These hills vary in altitude from 100 to 500 ft. above the level of the sea. At some remote period the various mountain ranges and lower series of hills have been subjected to a powerful volcanic upheaval, the past action of which may be plainly traced not only in their general outline, but likewise in the igneous rocks which in many places protrude above their surface, and crop out in the rents and fissures of the numerous ravines which intersect them. It may also be plainly seen that water has played an active part not only in the denudation of the hills themselves, but likewise in the formation and deepening of the ravines and gullies in whose beds both the volcanic and sedimentary rocks in many places lie exposed, where worn boulders and other fluvial debris are distributed in extensive deposits along their courses. In the auriferous series of rocks the slates form the base, but these are often penetrated by extensive bands of dioritic rocks which frequently crop out on the summits of the highest hills, and not unfrequently intersect the plane of the auriferous strata throughout a large area of country, while metamorphic rocks and conglomerates, in which quartz debris and water worn stones are abundant, are at times found in juxtaposition with them. Upon examination of the internal structure of the rock formation it is seen that although the slates were originally deposited in the horizontal plane by the upheaval of the volcanic rocks from below, they are now frequently inclined more or less, and are placed not only at every angle of inclination, but very often in a vertical position. In these slates beds, which are of varied thickness, and occur in varied stages of formation, the gold-bearing lodes are found assuming generally a north-easterly and south-westerly strike, and westerly dip or inclination, but forming by their sinuous and often devious courses an intricate network of reefs which traverse the entire series of auriferous rocks. Many of those quartz lodes—in which not only gold but silver, antimony, copper, iron, and various other minerals exist either in their simple state or in combination with each other—vary from a few inches to 10 and even 20 ft. in width and over, while not a few of the richest leaders or smaller reefs, when unearthed by the miner, are unfrequently discovered to be no thicker than the blade of an ordinary knife. Here, as elsewhere, it is impossible to account for the varied and even eccentric distribution of gold in the reef formation, but it is a generally ascertained fact, on this portion of the gold field at least, that where an auriferous lode junctions or comes in contact with another lode at right angles to its own course, or when it is crossed by one passing completely through it in an opposite direction, a deposit more or less rich of the precious metal is usually found at or near the point of contact, while likewise an auriferous leader, when running in close proximity to or towards a layer reef, will not unfrequently produce rich gold as it touches or even approaches the larger body of stone. Again, it has been found in more than one notable instance that where the gold-bearing lode has come in contact with or been cut off by a slide or sudden break in the auriferous rocks, the reef as it approached the fissure would often yield a rich deposit of the precious metal, whereas on the other side of the break where it would naturally be thrown out of its course, it would invariably prove entirely barren. Perhaps one of the most remarkable of these breaks in this division of the gold field is what is known as the Mountairi Slide, which, beginning close to the old Shot-over claim, passes in an easterly by southerly direction close to the foot of Messenger's Hill, and thence along the base of the main hills behind the Queen of Beauty to Hope Creek, a distance of considerably over a mile. The width of this enormous slide, so far as it has been proved in the workings of various mines, varies from a few feet to 30 ft. and over, while it is mostly formed of a tough bluish clay, mixed with particles of quartz and rounded stones, the whole forming a conglomerated compact band, which is hardest towards the footwall or eastern side. It is likewise interesting to remark, as an illustration of the curious laws which must have governed at some period the auriferous formation, that whenever the gold-bearing lodes have been traced to their junction with this slide, the gold has invariably been deposited on its upper face or hanging-wall side, and when in some cases the reef has passed partly through the clay band, in many instances the former has been completely thrown out of its course, while in the majority of cases it has been entirely lost. Considering this slide from a geological point of view, it is no doubt at one period formed an open fissure, the effect probably of an earthquake or some other powerful volcanic action, which caused a sudden break or slide in this portion of the country, and left this gigantic rent to be filled by an alluvial deposit washed down through countless ages from the neighbouring hills. With the main topographical and geological

features of the Thames gold field impressed upon the mind, the imagination naturally reverts to those extraordinary deposits of the precious metal which a few years ago gained a world-wide reputation, and rendered this portion of New Zealand a veritable El Dorado. To seek to determine how these wonderful auriferous deposits were distributed in the deep recesses of the earth by the hand of Nature is not within the province of this paper, nor is it intended to dwell upon the history of their no less wonderful discovery—a discovery which secured wealth and affluence to thousands, and transformed with magic quickness the primeval forest into a thriving town.

On a future occasion I may, with your permission, furnish further extracts from the interesting article on the Thames gold field, and will now, as briefly as possible, describe a mineral district in West Cork, which consists of a range of hills and mountains 20 miles in length, running in a south-westerly and north-easterly direction, and forming the peninsula of—, and varies in altitude from 100 to 1200 ft. above the sea level. In the quartz and other series of rocks of which these mountains are built up, the slate rocks form the base, but these are penetrated by bands of dioritic rock, which crop out in the sides and summits of these mountains, and metamorphic rocks and conglomerates, containing quartz debris and rounded water worn stones, are abundant in the north and south fissures and ravines in the mountain sides. The slate rocks occur in various angles of inclination, but generally are found in a vertical position, so that violent volcanic action at a remote period must have occurred to upheave these originally horizontal slate beds. About 37 years ago, during an exploratory excursion among the mountains of West Cork, my attention was directed to a vast rent or fissure in the side of— mountain, running nearly north and south, and cutting completely across the strata; this great fissure is intersected by numerous metallic lodes and quartz reefs, running nearly east and west, or at right angles to it. I found at the points of intersection gold, silver, galena, iron, copper, mundic, &c.; and as far as I have been able to ascertain this great fissure (there are others in these mountains) is filled with soft clay (lookan), rounded water worn stones, and various metallic substances, washed down and deposited no doubt from the mountains. Assuming that gold may not be found in paying quantities—but no man can say it may not—the mineral field in question is beyond doubt one of the most valuable and extensive (undeveloped) in the United Kingdom, or probably in Europe. The *bona fide* capitalist may here safely invest his money; but before doing so he can in a few hours come from London or any part of England, and see for himself. If this property were situated in New Zealand or other colonies, setts or grants would consist of a few square yards, and there would be a rush to secure shares regardless of price, whereas in the present instance a whole territory of between three and four square miles has been secured on a lease of 31 years, free of royalty.

Cosheen Mines, Schull, Co. Cork, Nov. 25. WM. THOMAS.

GLEANINGS FROM GERMAN AUTHORS.—ON LODES.—III.

SIR,—Lodes alter in character according to depth. Near the surface there is often no ore, for the reason that the air and moisture have decomposed it, and the resulting salts have been carried away in solution. Many lodes contain at their outcrop only iron ores, mostly brown ironstone, which give way in depth to other metals of greater value. Silver and some lead ore lodes, which are often accompanied by spathic iron, have an outcrop of brown ironstone and manganese. Such iron-bearing outcrops are called gossans (German, iron-hat), and are in certain districts indicative of rich deposits in depth. It is often found that the ores become richer and more valuable as depth increases; particularly is this the case with argenteous galena, the silver increasing in quantity. On the other hand it frequently happens that the lode becomes poorer, and that the ore disappears altogether as with many brown iron ore and magnetic iron ore lodes. Gold lodes also, or quartz lodes bearing native gold, yield less free gold in depth, while gold-bearing pyrites often takes its place. Formerly it was held that lodes, like dykes, were filled by molten ores and minerals from below, but this is for the most part incorrect, for there occur in mineral veins ores and minerals, which either could never withstand the molten state, or are not at all fusible. Much more accurately is their origin attributed to the deposition of their contents from solutions in warm or cold water. In water nearly all substances are more or less soluble, and under certain conditions may otherwise insoluble substances be dissolved. Minerals and ores have thus crystallised out of their solutions, just as salt crystallises out of its solution when the water is slowly evaporated. The filling up of lode fissures in this way must of course have required an immense period, and minerals, such as gypsum, calc-sinter, and brown ironstone are no doubt still being deposited in lodes.

The question still remains where the ores which were deposited from solutions came from, seeing that only exceedingly small quantities are under ordinary conditions soluble. Either the water came from the interior of the earth charged with the substances, or it has dissolved them out of the country rock. The learned have proved that nearly all substances are contained in most rocks, though in very minute quantities. These small particles are taken up by the water and carried into the fissures where they are precipitated, and notwithstanding the small proportion of ores and ordinary lode constituents yet a large quantity of rock may contain sufficient to fill a relatively small fissure.—*Prelheli*, Nov. 28. J. G.

UNITED MEXICAN MINING COMPANY.

SIR,—The shareholders of this company seem to be at last on the point of reaping a rich harvest for their long-continued patience and endurance of calls. By the last accounts received a profit was made for the week ending Oct. 28 of \$1465.07, and for the month of \$3511.74, with every prospect of a much larger increase. Let old shareholders be assured that much better times are in store for them—in fact, before long there is very little doubt but that they will be in receipt of handsome dividends. T. K. C. Nov. 29.

TIN AND PETROLEUM IN MEXICO.

SIR,—Recent discoveries place the existence of tin and petroleum in large and paying quantities beyond question. The tin occurs both in veins and as stream tin. The ores are rich, yielding 60 to 70 per cent. of metallic tin, and are free from injurious impurities. Cordwood for fuel is abundant. One tract, containing over 200 square miles, has been hastily prospected with the result of finding stream tin in every water-course, in some places in bars 20 ft. deep, yielding by washing from 5 to 20 per cent. of tin ore. These can all be worked by hydraulicising at a nominal cost. The veins from which this stream-tin came have also been found, and in nearly every ridge over this area the veins crop, showing from 1 to 6 ft. of tin ore. The country is granite. Steps are being taken to mine and smelt the ore, but there is a good opening for capital to come in and reap large profits. A railroad will shortly run through the tin district. The petroleum has been discovered over a considerable district, but owing to lack of capital no attempt has yet been made to refine it. This cannot long continue, for in Mexico exists a good market for every petroleum product at full prices, and all heavily protected by duties. The prices of petroleum range from 50c. (2s.) to \$1 (4s.) per gallon wholesale, the duty being about 14c. per pound weight of petroleum, or about 1s. 6d. per gallon. Every requisite for successful refining exists—viz., deposits of soda and sulphur to make the necessary chemicals, abundant cordwood and staves for barrels, cheap labour (37½ to 50c., or 1s. 7d. to 2s. a day), and a healthy temperate climate. The crude petroleum is in large quantity, and from experiments made by the writer appears easily refined. It presents another of the many opportunities for favourable investments in Mexico. The industrial development of the mineral resources of this country offers to energy, science, and capital probably the most inviting and profitable field which this century has seen. The Americans, by large investments in railways here, are opening up the country to the possibility of successful enterprise, and if our countrymen will step in and develop mining and manufacturing undertakings, they cannot fail to reap a rich reward. Every manufacture is heavily protected, and a population of 12,000,000 of people are the customers. There is not a factory in the country which does not earn from 50 to 100 per cent. annually on its capital, working with antiquated machinery and processes. Raw materials for every manufacture are cheap and plenty, the customers are here, the prices excellent, labour cheap, and a healthy climate, never too hot nor too cold. It is well

worthy of consideration by our countrymen whether it is not better to invest capital here under such favourable conditions rather than at home in the midst of fierce competition and the miserable climate of Britain.

Vaca Ortiz, Estado de Durango, Mexico, Nov. 6.

THE NEW CALLAO (LIMITED).

SIR,—Will you allow me to say, in reply to your correspondents "N. N.," "J. E. S.," and "W. B.," that the accounts of the company are now being made up, and that a general meeting will be held this next month (December), when the directors hope to lay a good report before the members.—*London*, Nov. 30. F. J. WARNER, Secretary.

ST. JOHN DEL REY MINING STOCK.

SIR,—Your correspondent "Ten Pounder" does not, perhaps, see that the move for making 1½ shares comes from a "bull"—a gentleman who figures as a "bull" at the meetings of the company and in the Stock Exchange Mining Market; also in the *Mining Journal* and a daily financial paper. The mine is not backing him up well; it is difficult to keep the price at the absurdly high figure—160 or thereabouts—or it would be difficult were there any sellers. We all know that the Morro Velho Mine has been splendid, that it is now worked to a great depth, and the ore is not rich as formerly; water does continue to get in the mine and cause trouble, notwithstanding the predictions of "Investigator;" also, that Cuibana has disappointed the expectations of its friends, all hopes for the future of this mine being purely speculative.

When the celebrated Consolidated Virginia and California mines of Nevada were in failing condition, the manipulators of the share market, being large holders, arranged to cut up the shares, so that people of small means could invest. They made 540,000 shares for each company, and made a market at \$90 per share, which faded away to 20 cents per share, and hurt the people who put in their small means. It is not an argument against investing in mines that mines will, must give out. Mining investments for this very reason should receive while the mine lasts large dividends, but the public should discriminate when investing, and learn that it is not what a mine has paid, but what it will pay that makes it valuable, and mines cannot last always.

Brokers and jobbers make profits by dealing in shares. The move for cutting up St. John del Rey stock looks like an effort to make a market for unloading. I notice that the *Mining Journal*, in the list of dividend-paying mines, says St. John del Rey divided for the half-year 5 per cent. When a company pays 5 per cent. once a year how can it be rated as a half-yearly dividend? INVESTIGATED. City, Nov. 28.

COLORADO UNITED MINING COMPANY

SIR,—I have before alluded to the Stock Exchange cloud hovering over this company, and with regard to Mr. Smyth's circular need only say that I am as desirous of dividends as any one, but fail to see why I should distrust either the manager or the directors in procuring one. The directors seem to me to have done their duty in a way to merit the confidence of the shareholders. It may not be generally known that they have not drawn fees for several years, and have given up a large sum to which they were entitled under the Articles of Association. They had a right to five guineas each for every meeting held. Instead of charging this sum they have contented themselves with two guineas only, not only so, but at the last general meeting they voluntarily proposed to give up the right to take fees for each meeting, and to take among them 500l. a year instead. This was equivalent to surrendering about 700l. a year to the shareholders. When directors act in this handsome way they ought to receive confidence and gratitude in return.

In place of this Mr. Smyth proposes to interfere with their management on the ground that they are not treating the shareholders fairly. I have had confidence in Mr. Hamill, the manager, because he has held his 20,000 shares. If Mr. Smyth has acted like Mr. Hamill in this important particular I shall listen with the greater respect to his charges against Mr. Hamill's management. The only fault that I can find with the directors is that they sent out a clerk to Colorado, who has failed to send home regular accounts. In a circular from the board it is stated that Mr. Ward has ceased to be clerk. I look forward with curiosity to an explanation of the reasons why he was ever entrusted with a duty which he does not seem to have discharged. If Mr. Smyth proposes to censure the board on this ground I am disposed to support him, unless a good defence be offered. It is true that Mr. Ward has sent home letters about the mines, but this was not the chief duty he had to discharge, and for which he has been paid. Shareholders should be careful before they give their proxies to any one on an *ex parte* statement. London, Nov. 29. ARGUS.

INDIAN GOLD MINES.

SIR,—I would venture to suggest that much of the present disappointment, and consequent depression, has arisen from the companies first passing through their mills large quantities of surface quartz, repeatedly said to contain but little gold, and indeed almost worthless. I am not acquainted with practical mining, and therefore may be suggesting that which could not in practice be carried out, but I would still say that if it be possible, all such poor stuff should be put entirely aside, to be dealt with in the future. It is not, as it seems to me, fair or business-like to put the very worst face upon this new industry at starting; unfair to shareholders who have waited so patiently and seen their property so beaten down; and unbusiness-like, because the general producing capabilities of the mines are not thereby fairly shown. In future, therefore, I suggest that average quartz be crushed, and not the worst. Then, if all that is said of the richness of the mines be true, or if even half an ounce to the ton be obtained, there will speedily be a reaction from the present depression caused, I verily believe more by inconsiderate and inefficient management than anything else. I subjoin a few encouraging facts—

1. The Colar Company recently crushed a sample of quartz at Greenwich by the Readwin pan process. It gave at the rate of more than 5 ozs. of gold to the ton.

2. The Phoenix crushed 32 tons from Groves's Tunnel. The produce was 21 dwts. per ton free gold. The pyrites—equal to 16 tons—assayed 3 ozs. to the ton; together the result was 2 ozs. 11 dwts. per ton. It is this quartz which is now being crushed in large quantities.

3. The Glenrock has the same reef in their property adjoining, and are now working upon it. The results should be the same as the Phoenix.

4. The Trevelyan, after crushing surface quartz with but little result, has gone deeper, and obtained by fire assay 1 oz. 18 dwts. 5 grs. of free gold per ton.

5. At the Cootacovil meeting a few days since, Mr. Harvey, the company's engineer, and a most reliable authority, again positively affirmed that the produce from free gold alone would be half an ounce to the ton.

6. The Rhodes Reef stated a month since that of the 400 tons of quartz crushed prior to August, there were 50 tons of pyrites that would yield 5 ozs. of gold to the ton. This in itself, irrespective of free gold, is more than half an ounce to the ton of the entire quantity crushed.—*Nov. 30.* OBSERVER.

COPPER MINING COMPANIES.

SIR,—Your correspondent "An Observant Investor" is apparently so smitten with the charms of Pannicillo and Copiapo that he can see no beauty in the favourites of other men probably equally as observant as himself. Whether Copiapo is his prime favourite or Pannicillo does not appear, but the mines he is so satisfied with may have all the elements of stability an investor could wish for; but this is not proved by saying, as he practically does, "either the shares of other copper mines are too high or mine are too low." He does not admit that both may be good value at present quotations. Let us see if Mason and Barry, which has his worst word, is not really worthy of increased appreciation rather than of depreciation. Three points are essential in a good mine—funds reserved from past profits, present profits, and reserves of ore. The capital is 1,851,640l., and

there are no debentures. The mine is valued in the balance-sheet at 930,510l. only, or a little over three years' profits, and the rest of the capital is represented by land, works, and buildings in Portugal and England, railways, shipping piers, stocks of ores, and stores, and floating capital. Last year the dividends paid were 10s. and 15s., or 12½ per cent., and the same interim dividend (10s.) has been paid this year. At present price the return is about 8 per cent., which is surely a satisfactory interest. Now, as to ore reserves. Measured down to the lowest present working level there is sufficient developed for over 20 years working at the present rate, and even at that level the ore is leading downwards in a solid mass. Can anything be more satisfactory.

I may now suggest that it is his mines which are at inflated values. His own figures show that Copiapó earned less in August than in July with all the advantage of that better price for copper on which he speculates so boldly for future marvellous dividends. I have heard too that this mine it depending on a surface lode. This surely ought to be reckoned as a serious element of weakness. But I have no wish to "bear" his property, and so will say no more; but for the future he will do well to remember that those who live in glass houses should not throw stones.

Edgeacre-road, Nov. 28.

MINING CRITICS.

SIR.—It is occasionally amusing to notice the remarks made and the resolutions proposed at mining meetings by shareholders who evidently have not much knowledge of even the rudiments of mining. It is said that at a meeting in one of the mining offices in the City the manager of a mine proposed the sinking of a new shaft with the object of more effectually laying open a discovery in the mine, on which a shareholder rose and solemnly proposed that, in order to exercise strict economy, it would be desirable that an endeavour be made on the part of the directors to obtain "a good secondhand shaft."

Somewhat after the same fashion were the remarks reported to have been indulged in by a shareholder at the last meeting of Devon Great Consols. This mine is acknowledged to have proved one of the most remarkable and most productive in the history of British mining. Some years ago friends who had the privilege of joining the British Association in an excursion from Plymouth up the River Tamar to this celebrated mine were furnished with an interesting printed description of the workings, and the result of the operations from the commencement, and in which description are the following striking facts:—The first outlay of capital did not reach 1000l. At the end of the first year the dividends out of profits amounted to 73,000l. Up to April, 1877, copper ores had been sold—609,280 tons; value, 3,226,426l. Total dividends paid to shareholders 1,195,520l. The deepest point reached was 300 fms., and the levels and other explorations were nearly 40 miles long, traversed by six miles of tramway.

After all these splendid results, a shareholder at the recent meeting—who admitted he knew nothing of practical mining—among other statements, coolly made the announcement that in his opinion the manager was a simple pretender; an opinion based on the fact that certain explorations in search of further discoveries had not come up to general expectation. On the occasion of the visit of the British Association it was explained that, in addition to the vast raisings of copper ores, arsenic to the extent of 15,000 tons had been raised and manufactured on the spot, and that it was due to the energy of the present manager of Devon Great Consols that the works had grown from a comparatively small manufactory to the largest arsenical works in the world. It will, perhaps, scarcely be believed that, at the last meeting of shareholders, this energetic mining authority, after a connection with the company of, probably, over 30 years, had to listen to the assertion of a perfect stranger, who knew comparatively little of the matter, that he (the manager) was a mere pretender in his profession, and was not worthy of the shareholder's confidence. Such, however, seems to have been actually the case.—*Taristock, Nov. 29.* N. B.

TRENTHICK MINE.

SIR.—Amongst the mines now being, or about to be, restarted is Trenthick Mine, in St. Agnes, a copper mine of high promise. The old workers had a lease of Lower Trenthick only, the land of Lord Falmouth, which was very limited on the course of the lodes, four in number. The owner of the land at the east (Higher Trenthick) declined to grant at that time; but he is now disposed to do so on liberal terms, giving about half a mile extension in that direction. The owner is Mr. Jose, of Mellinger, near Perranwell station. The mine is shallow; but a 50-in. pumping engine is to be erected. One of the lodes has yielded much copper ore, the others not much tested. The mine is in a district of renown for mineral wealth, being in the locality of Great Wheal Charlotte, which gave large profits on copper; also Wheal Towan, which gave 200,000l. profit; Wheal Sparrow, at the west, gave 30,000l. profit; also South Towan, United Hills, and Tywarthaile yielded large returns. R. SYMONS.

Truro, Nov. 24.

COPPER MINING IN NORTH WALES.

SIR.—It does seem strange, as was truly remarked in last Saturday's Journal, that the copper producing part of North Wales should so long languish for want of the necessary capital to develop its numerous and highly productive, as well as favourably situated, copper lodes. Before the introduction of railways the mines on the southern and western slopes of Snowdon yielded thousands of tons of copper averaging from 10 to 25 per cent. fine copper, which was carried down the mountains by the miners in many instances, and in others by ponies and donkeys, and then taken over bad roads to market; and more than once the late Sir R. W. Bulkeley and others have replenished their empty exchequers from this source when other sources have failed them, and now to anyone who chose to come and see I can show lodes that will produce in sight from two to four or five tons of 12 per cent. copper to the fathom, capable of being worked to depths varying from 50 to 200 fms. by adit level drivages, and only waiting the appliance of inclines to bring down the produce, with the aid of rock-drills and approved dressing machinery, to compete with the most productive of foreign mines, and that too within nine hours of the Metropolis, and where every one investing can come and see for himself. I am pleased to add that we have just made a discovery in the Maudslay Mines which promises to be of immense value. CHAS. KNEEBONE.

Maudslay Mine, Bettres-y-Coed, Nov. 29.

WEST WHEAL ROSE.

SIR.—I observe in last week's Journal attention called to the statement that "East Wheal Rose, Old Shepherds, and West Chiverton lodes traverse this sett." Your correspondent "S. R. F." has shown the inaccuracy of this statement as regards the lodes of the two first mentioned mines; but, by his silence, he tacitly admits the statement in reference to the West Chiverton lode to be correct. Lest, however, your numerous readers should be misinformed, allow me, through the medium of the Journal, to inform them that this mine and West Chiverton are about three miles apart, and those best able to judge affirm that the course of the West Chiverton lode is, at least, two miles away. "S. R. F." has been rightly informed that only one lode, and that a very small one, has ever been seen in this sett. Let every encouragement be given to legitimate mining, but misrepresentations must of necessity be prejudicial to all sound Cornish speculations.—*Newlyn East, Nov. 30.* J. G.

WEST WHEAL ROSE.

SIR.—Your correspondent "S. R. F." states that the prospectus of this mine is erroneous. I also have perused the prospectus, and the reports that accompany it. The prospectus is clearly founded on the reports, and therefore "S. R. F." practically impugns the veracity of the gentlemen whose names are appended to these reports. Three at least of these gentlemen are frequent contributors to the Journal, and invariably acknowledge their contributions by appending their signatures to the letters they write. Perhaps next week "S. R. F." will say who he is, in order that Captain Richard Southey, Captain Charles Kneebone, and his own fellow

townsman, Mr. Robert Symons, may know who the individual is who has taken up his pen to prove them all incapable to act as mining engineers or surveyors. As all these gentlemen are more capable of taking care of themselves than I am of them, I will trouble you with but one further observation, which I trust "S. R. F." will comprehend. In my opinion it is an act of cowardice for an anonymous writer to attack the opinion of men who have fearlessly appended their own names to their published opinions. J. D. M.

London, S.E., Dec. 1.

MINING IN THE GWENNAP DISTRICT.

SIR.—Rumour states a syndicate has been formed with a view to the resuscitation of the Clifford Amalgamated Mines, which comprise the Great Consols United Mines and Wheal Clifford. It may interest some to know in the former mine alone (Great Consols) from the year 1819 to 1845 upwards of 700,000l. was profited from a sett about a mile in length by 200 fathoms in breadth, in which the united length of levels extends more than 63 miles. At the end of 1837, for a period of 18½ years, the accounts of the same mine exhibited the following particulars:—Quantity of ores roasted and sold, 259,420 tons, the value of which was 1,845,326l.; out of which the lords received as dues 76,888l. The bottom of the mine is nearly 350 fathoms deep, and the temperature is about 96°. This hill, which comprises the three mines above stated, has yielded about one and a-half million sterling profits to the different companies, and there is no reason why the next company working on a large scale shall not be equally remunerative. CHAS. BAWDEN.

St. Day, Scorrier, Cornwall, Nov. 29.

OBTAINING MOTIVE POWER FROM FALLING WATER.

SIR.—Referring to the allusion in last week's Journal as to obtaining motive power from falling water invented by Mr. George Wilson, of Brixton, we beg to refer you to an old idea on the same principle invented by John Macintosh. See Blue-Book 2953 in the year 1861. BRINJES AND GOODWIN.

Whitechapel Engine Works, London, Nov. 28.

[For remainder of Original Correspondence see Journal.]

THE MINERAL RESOURCES OF IRELAND—No. VI.

BY THOMAS TONKIN, M.E.

In the County Tyrone is contained a small area of coal formation, six to seven miles long and about two miles in width. Six seams have been discovered, which together contain nearly 4 fms. in thickness of splendid free-burning bituminous coal. A good deal of this has already been worked out, but sufficient remains to be of great local importance. Fire-clay and clay ironstone are also found, the latter in small quantities. The Leinster coal field also deserves some notice; it is contained in the counties of Kilkenny, Carlow, and Queen's, and is drained by the Nore and Barrow Rivers, which surround it on three cardinal points of the compass—south, east, and west. The order of stratification and composition of the alternating beds are similar to those of other coal formations, a description of which, therefore need not be entered into. The shale beds, of which there are many, are rich in clay ironstone, and fire-clay is also plentiful. Formerly this coal field was said to contain as many as eight workable seams of anthracite coal, but as three or more of the top seams may be regarded as to a great extent worked out its original value as a coal-producing district will be considerably impaired; it is still, however, of local importance, and capable of yielding large quantities of fuel, and why not also the abundance of ironstone be turned to useful and profitable account? When the price of copper was high, and foreign competition not so keen as at present, it is but fair to say that some little attention was paid to the districts of Ireland most likely to produce large quantities of copper, and one or two places I have not yet named come prominently to the front as copper mining districts.

The Waterford district is composed of clay-slate, and several veins of copper and lead ores are contained in a distance of about three miles along the coast, from the Bay of Dungarven on the west to the Bay of Tramore on the east. The lead ore veins above mentioned contain, as seen in the cliffs, but spots of ore, diffused through a quartz and calcspar gangue, and so far as I know have not been worked or proved either in length or depth. The copper lode, however, met with more attention, and one large lode in particular was operated on to an extent which made the place famous for the quantities of copper it produced; the lode averaged 10 ft. wide, on which the operations were pushed to considerable depths, and in its palmy days the Knockmahon Mines, of which I am now speaking, yielded about 10,000 tons of yellow copper ore per annum. The percentage of copper contained in the ore was from 8 to 10, and above 1000 persons were employed; this, however, may now be regarded as a matter of the past, the mines became deep and expensive, and in sympathy with the languid spirit of mining enterprise in times of depression operations were discontinued, and what was once a scene of busy and profitable industry is now a desolation.

The Wicklow copper mining district occupies a narrow band of clay-slate about 10 miles long, remarkable alike for the large deposits and beds of iron pyrites it contains. As for the quantities of copper it produced, both in the shape of ore and carried in solution in the water (as sulphate of copper) from which it has been precipitated by means of metallic iron, large and profitable mining operations have been carried on for a great number of years in this district, sustained in great part by the highly cuperiferous nature of the pyrites, and it is gratifying to add that some vitality still remains in the locality. The granite formation of the County Wicklow contains large quartz veins showing bunches and spots of lead ore; the vicinity of the Seven Churches particularly may be regarded as worthy of notice in this respect. It is also worthy of remark that at Ballintemple, in this county, several thousand pounds worth of gold was obtained in the alluvium of the valley, in the shape of nuggets and gold dust; history has handed us this information, though not from a very distant date, and as this must have been removed from the sides of the hills to the valley by detritus, it seems likely there is more gold where that came from. In the clay-slate formation of the counties of Armagh and Down occur lead ore veins, on which prospecting on a small scale was carried on from time to time, resulting in the discovery of ore and subsequent working of mines, which, however, did not yield ore in paying quantities.

The Antrim iron ores, which are obtainable there in very large quantities, of late years have been imported to the furnaces of our West Coast, and is well adapted for mixing with refractory ores. Iron ore and other minerals have been found in other places which I have not noticed, and materials for ornamental architecture are very widely diffused throughout the country. Galway is not the only place remarkable for the extent and beauty of its marbles; in the West of Galway and Mayo are found beautifully variegated white and green marbles; in King's County and in Tipperary grey marbles; in Kerry there are white and black variegated marbles, also marbles of white, purple, and yellow; at Churchtown, in Cork, occur marbles of red, yellow, and brown colours, as well as white, and blue and white. Marble stone is also found in Limerick, Down, and several other places. In several places along the clay-slate coasts roofing slate and flags are found in abundance. Far from being a purely agricultural country, Ireland is capable of yielding metallic and other minerals if its mines, &c., were vigorously developed. I have endeavoured to point out the most desirable localities to speculate in, and I am of opinion that with skill and caution some capital selections may be made. It is a well known and authenticated fact that the early days of Irish mining were characterised by indiscriminate attacking almost every place where indications of any kind were observed. This ill-advised and precipitate mode of procedure resulted in the spending of large sums of money, where very often the chances of success were very meagre, and though many places were tried few were proved in a proper manner. If the means at disposal were concentrated on the opening out of the mines or champion lodes of the country, there is little doubt but in most instances the results would have been satisfactory, even though a few thousands only in most instances were available as a working capital. I shall not now further

trespass on your valuable space, but if time and circumstances permit may at some future time resume the subject.

REPORT FROM CORNWALL.

Nov. 30.—Mining matters in the county continue practically unchanged, and any features of interest are confined to individual mines, a few of which have in various ways attracted attention. Dulness, however, is now likely to have almost undisputed sway for the rest of the year. One favourable feature is that the weather, although inclement and stormy, has been less persistently rainy since our last than for some little time previous; the full advantage of this, however, has yet to be reaped. Some little time always elapses before rains increase the work of the pumping-engines, and when once the ground is saturated it takes a little time also to work off the accumulation of water after the rains begin to fail. As a rule, the deeper the mine the larger the interval, though to a large extent this must always depend upon the nature of the ground.

To our thinking there is every indication that the directors of Devon Great Consols are right in anticipating the conversion of that famous copper mine into one of tin. All the phenomena point in that direction, and there seems no possible reason for doubting that the same rules which apply to the mineral veins of the Redruth, Illogan, and Camborne districts—and which have been proved there over and over again—apply round Tavistock as well as in West Cornwall. Nay, we may go further back. All our older copper mines were originally mines of tin, and the reversion from copper to tin is only repeating in the deeper parts of the lodes the conditions of the shallower. That something of the same conditions existed in Devon is proved by the fact that the stream works of that county were originally by far the most productive of the two. These were supplied, undoubtedly from the upper portions of the lodes, probably denuded to a greater extent in Devon than in Cornwall. This would account at once for the very great comparative paucity of shallow tin mines in Devon, and supply the only element in which this comparison between the main groups of mineral veins in the two counties have by some been thought to fail.

Dr. Le Neve Foster, now the Inspector of Metalliferous Mines for the North Wales district, but until recently the Inspector for Cornwall and Devon, has made some valuable remarks upon the statistics recently published by the Engineering and Mining Journal of New York with regard to the frequency of accidents in metalliferous mines as compared with coal mines, and the relative safety as means of descent and ascent of ladders, cages, and man-engines. With regard to the first point, he shows that while it is true that the danger to life is less in metalliferous mines than in coal mines, the difference is really very slight if those exposed to underground risks only are taken; the death-rate from accidents per thousand underground being 2.57 for the coal mines of the United Kingdom, against 2.39 for the metal mines, whilst in Cornwall and Devon the noted percentage of miners proper have been actually in excess, reaching over the same period 2.63. Including the surface hands the results are precisely the reverse, the figures for the coal mines being 2.24, for the metal mines of the kingdom 1.63, and for those of the western district 1.59. It follows, therefore, that while underground operations are more dangerous in the metal mines of Cornwall and Devon than in other parts of the kingdom, surface operations are much more safe. This we take it is due to the large number of hands employed in the dressing-floors of our tin mines, and the small risks they run. The figures are very instructive, and amply prove the startling conclusions to which Dr. Foster came "that in spite of immunity from explosions of fire-damp the occupation of the metal miner is almost as dangerous as that of a collier; indeed, so far as my district is concerned it appears to be a shade more dangerous."

We are specially indebted to Dr. Foster, however, for his comments upon the statistics recently published, which seemed to prove that cages were more dangerous than ladders, and man-engines most dangerous of all. Without at all questioning the accuracy of the Prussian statistics, upon which these conclusions were based, Dr. Foster thinks they may be made to prove exactly the reverse, and shows very clearly how the fact is, as he points out that the mines in which cages are used are, as a whole, very much safer than those in which ladders are employed. Taking the actual distance travelled, therefore, into account, in other words, the duration of risk, it is easy to see that the cage risk is really the lesser of the two. "In other words, if the men had ascended and descended by ladders the mines now served by cages there would probably have been more accidents than have actually occurred." Precisely the same line of argument applies to the man-engine comparison, further qualified by the difference in safety of the single rod over the double rod machines. At any rate, for seven years in Cornwall and Devon the death-rate by the single rod man-engine of the West was only 0.14 per thousand, against 0.21 per thousand with the ladders, in spite of the average distance travelled being greater. So we have not been on the wrong track after all.

A valuable paper has been read before the Mining Institute by Capt. Bishop upon "The Importance of Drawing in Deep Mines." There is probably at the present moment no question of equal importance which requires so much attention in connection with our local mining industry, and Capt. Bishop dealt with it in admirable fashion. He paid particular attention to the need of the provision of good shafts, regarding the diagonal shafts as the most defective; and pointed out the need also of greater care being taken in the construction of skip-roads. Improved methods of filling the skips were also suggested; and the abolition of the "holding down" pulleys. The President, Mr. W. Husband, made a valuable suggestion for the adoption of the compound engine for winding purposes, and this proposition, as well as the majority of Capt. Bishop's proposals, was heartily approved by the members present. We are glad to see the Institute doing such good work.

REPORT FROM NORTH AND SOUTH STAFFORDSHIRE.

Nov. 30.—The Coal Trade is not over brisk this week, for the season keeps too mild to stimulate coal merchants to lay in stocks of Cannon Chase house fuel, and the early prospects of the iron trade are not such as to make ironmasters desirous of entering into big contracts for manufacturing coal. Prices of furnace sorts stand at 9s. 6d. to 11s. per ton, according to quality. Ironstone is pretty active at, for Northampton sorts, 6s. to 6s. 4d. per ton delivered into the Birmingham and Wolverhampton districts. Foreign pigs keep in quiet sale. Thorncliffe brand is quoted at 62s. 6d.; Lincolnshire 52s. 6d. to 55s.; Blaina hematites, 64s. 6d. delivered; Barrow ditto nominal at 70s. As to native pigs best all-mine sorts are 67s. 6d. Finished iron is dull in the matter of new sales, and buyers will not give makers' terms.

On 'Change in Wolverhampton it became known that the new local steel company, which will produce basic metal, have appointed as their manager and secretary Mr. Fitzmaurice, formerly of the Cwm Avon Tin-plate Works, South Wales.

The arbitrators under the South Staffordshire Mines Drainage Acts have made their draft award for mines drainage rates in the Old Hill and Kingswinford districts. A rate of 3d. per ton on fire-clay and limestone, and 6d. per ton on ironstone, coal, and slack, is required for the Old Hill district. The Saltwells and Dudley Wood Collieries of the Earl of Dudley are assessed at only one-third of the rate, and part of his lordship's Warren's Hall Colliery, along with the Yew Tree Colliery of Messrs. Cochrane and Co., are assessed at two-thirds of the rate, and the Withynoor Colliery of Messrs. George and John Dunn is assessed at five-sixths. The rate required for the Kingswinford district is 2d. per ton on all minerals, and no graduation has been granted. The award can be further appealed against on Dec. 23.

The award of Alderman Avery, the arbitrator to the Mill and Forge Wages Board, gives the puddlers a rise of 3d. per ton, making wages 8s. 3d., and millmen an advance of 2½ per cent., to come into force on Dec. 31, and to exist certainly during the first quarter of the year. According to the award, the new rate may be terminated by either side, after March 31, by giving one month's notice. Alderman Avery is of opinion that the best interests of the trade, both as respects employers and operatives, would probably be promoted by

the adoption of another sliding-scale, and he recommends the board to take steps for the formation of such a scale.

Before the Willenhall magistrates, on Monday, Mr. Reuben Plant, owner of the Beacon Colliery, New Invention, near Wolverhampton, was charged with breaches of Rules 23, 24, and 29 of the Mines Regulation Act. Mr. W. B. Scott, the Assistant Inspector of Mines, visited the colliery on July 7, and found that work was going on in a shaft 20 yards deep without any indicator being in the engine-house to show the position of the cage. There was no fencing around the fly-wheel and cranks of the engine; and there was no record in the office-books of any inspection having been made since June 7. The Bench fined the defendant 5*l.* and costs for each offence.

THE NEW PROCESS OF MAKING STEEL.

At the South Staffordshire Mill and Forge Managers' Association meeting on Saturday, held in the Mining Museum, Dudley, Mr. R. Edwards presided, and there was a large attendance. Among those present were Messrs. Alfred Hickman, C. Cochrane, J. J. Solly, Turley, J. G. Wright, H. Johnson, sen., W. Farnworth, H. Johnson, jun., Millard, Hudson, Rigby, Harris, E. Hickman, C. Chambers, J. G. Wright, Henry Johnson, sen., A. McBean, Jeremiah Stead (Middlesbrough), A. H. Hutton, W. Farnworth, jun., J. McCarthy, W. Davis, M. Whitehouse, J. Hufham, J. Matthews, C. Oates, C. Passfield, R. Latham, T. Parton, Thornton, J. Morris (vice-president of the association), H. PARRY, W. Yeomans (hon. secretary), &c. Letters of apology for non-attendance were received from the Mayor of Dudley (Mr. J. Garratt), Mr. B. Hingley, Mr. Barker (Wolverhampton), and others.

After some formal business, the Chairman invited Mr. Gilchrist to read a paper on the Thomas-Gilchrist process of making steel. The paper was purely technical, and thoroughly exhausted the subject. The reader showed that the enemy to the puddling furnace—phosphorus—was the friend of the Thomas-Gilchrist process, for, in utilising it they obtained a heat sufficient for their purpose. Some of the most satisfactory results of the process had been obtained from the Staffordshire pig, but the Continent had taken up the matter in a far greater ratio than England. Here the make was 572,604 tons per annum, there it was 1,136,600 tons.

Mr. C. Cochrane complimented the reader on his paper, and expressed the pleasure he felt in knowing that the process was a step in the right direction for maintaining the celebrity South Staffordshire had obtained in the past. Mr. Hickman held that, with a declining trade, it would be well to give the new process favourable encouragement. South Staffordshire coal contained but little sulphur, and therefore was excellent fuel for the process under discussion.

Mr. Stead (Middlesbrough) spoke in favour of the process, and Mr. J. G. Wright asked a question as to the comparative cost of puddling and the ingots produced by the process. Mr. Gilchrist held that it would be about 7*4s.* 11*d.* for puddled bars, and 6*9s.* 8*d.* for the base ingots. Mr. Solly argued that the metal made by the Thomas-Gilchrist process did not weld favourably; for chains it would not do, and it was not successful for boiler rings; but the sheets were good. A member pointed out that the new process would deprive the district of tap cinder. Mr. Hickman thought it would be a long time first, and pointed out that it was the rolling they gave their iron that made it fibrous. Mr. Farnworth said he had found no difficulties as to welding; of course it required different treatment. Mr. Gilchrist, in reply to questions, pointed out that if the steel was not fit for chains, there was plenty of room in the making of sheets, and he should make an effort to remedy the objection. (Laughter.) As to the scrap made from their process, the Germans made it up into rivet rods. There was no reason why steel should not be made as cheap in South Staffordshire as in Middlesbrough. A member had said that small quantities could be made more profitably by the puddling process than by the other; but he would remind them that puddling was more than 200 years old, and in that time many wrinkles had been obtained. The Thomas-Gilchrist process could be improved, although it would not supersede puddling yet awhile. The reader then exhibited tubes, sheets, and other specimens of the basic steel, and these were admired by the audience. Mr. Hickman proposed a hearty vote of thanks to Mr. Gilchrist, and said it was time to look after the new process when they saw such material on the table. It was a question in the future of quality, not quantity. Mr. Wright seconded the vote, which was carried unanimously. Mr. Gilchrist replied.

The author further remarked that the common Staffordshire pig-iron with which he experimented last June at Wednesbury had, before being melted, the following composition:—Strong forge pig—manganese, 1.12 per cent.; silicon, 1.17; sulphur, 0.08; phosphorus, 2.97. Grey Forge pig—Manganese, 1.13; silicon, 1.67; sulphur, .05; phosphorus, 2.72. The strong and grey forge were mixed in equal proportions, and melted in the air furnace, and the resulting metal contained:—Manganese, 0.75; silicon, 1.28; sulphur, 0.10; phosphorus, 2.94. The authors presented the analysis which they had specially obtained from Mr. Windsor Richards, which had been made by Mr. E. W. Cooke, the chemist to Bolckow, Vaughan, and Co., of the pigs which that company used up in the basic process on the Thursday previous to the meeting—Nov. 23—and analyses of the rail made from it, and of the basic brick used for the lining of the converters that day. The analysis of the brick was—Lime, 49.91 per cent.; magnesia, 30.72; alumina, 4.50; oxide of iron, 3.46; and silica, 11.41. The analysis of the pig used was—Iron, 92.85; combined carbon, 1.10; graphite, 2.25; manganese, 0.60; silicon, 1.30; sulphur, 0.15; phosphorus, 1.75. The rail analysis was—Iron, 92.25; combined carbon, .46; manganese, 1.18; silicon, trace; sulphur, 0.05; phosphorus, .60. The casket of basic steel which the authors exhibited as having been presented to them by the central director of the Kladno Steelworks, Austria, was made from pig containing carbon, 3.05; silicon, 1.06; phosphorus, 1.86; manganese, .48; and sulphur, .26. The ingot iron of which the casket was wrought contained carbon, .18; silicon, traces; phosphorus, .05; manganese, .34. The inventors made up their total of 37,639 tons as the output of steel by the Continental Works, by the basic process, during the month of October from the following details, for which they had specially written, to the works named:—France: Schneider and Creuzot, with two 7 ton converters and one 10 ton Siemens furnace, 1240 tons; Belgium—D'Angleur Works, Remory, with two 6 ton converters, 1687 tons. Germany: Rothe Erde Works, Aachen, three 5 ton converters, 3900 tons; Bochum, three 4½ ton converters, 2835 tons; Gutehoffnungshütte, two 6 ton converters, 1335 tons; Hoerde, three 10 ton converters, 4100 tons; Peiner Works, Hanover, three 10 ton converters (but only one at work, which commenced in September last), 418 tons; Rhenish Steelworks, two 6½ ton converters, 3000 tons; Dortmund Union, two 9½ ton converters, 7000 tons; D'Wendel, Hayange, four 8 ton converters (return not received in time), estimated at 3000 tons.—Austria: Kladno Steelworks, three 5 ton converters, 1854 tons; Teplitz, two 6½ ton converters; Wilkowitz, two 8 ton converters, 3000 tons.—Prussia: Varsovie Works, 1270 tons. In concluding their paper Messrs. Thomas and Gilchrist said that among the steel engineers of England and abroad who stood out prominently as having, by their "most loyal" co-operation helped to make the basic steel process a great commercial success, were the names of Martin, Windsor Richards, Schneider, Stead, Massey, Pink, Pastor, Cooper, Snelus, Riley, Angleur, Heskett, Kupelweiser, Wahrman, and Wallrand.

In the discussion which followed the reading of the paper, Mr. Alfred Hickman said it appeared to him the practical way the Staffordshire men must look at this question was by asking themselves three questions—first, was this process a success? If it was a success, was it going to supersede their old-fashioned puddling furnaces? If so, what would be the effect upon the trade of this district? The figures which Mr. Gilchrist had given, he thought, showed that at any rate the process was a success. When the meeting of the Iron and Steel Institute was held at Vienna, he (Mr. Hickman) accompanied Mr. Gilchrist to several large Continental works, and made some very exhaustive enquiries. The managing director of one told him that the Bessemer pig cost 6*s.* per ton more to produce than the basic, and that although the difference between the cost was only 6*s.*, he found the basic process the most advantageous, and that from that time the firm were abandoning the Bessemer pro-

cess, not because they always had better results with the basic process, but because the latter was the more reliable, and always produced the same results, or nearly so; whereas the Bessemer production was sometimes good and sometimes inferior. He there saw wretched white iron—the rottenest pig he ever saw made to produce the most splendid results he ever saw in his life. At another works at Teplitz he saw some iron being rolled—a section which in South Staffordshire they would call very difficult indeed—and the pieces were rolled to 30 or 40 ft. long, and there was not a waster on the ground. This was all done with common white iron, and after seeing that he had to admit that there was something in Mr. Gilchrist's statement that the difference between the best and the worst iron was only a small percentage of phosphorus. As to whether the basic process was going to supersede altogether the old puddling process, the managing director at the works before referred to told him that they would by no means do away with the puddling, and that they were about starting a new forge, an announcement he (Mr. Hickman) was glad to hear, seeing that the works comprised old-fashioned puddling forges, a Bessemer plant, a basic plant, and also Siemens' and Martin's plant, and that, therefore, the firm had the opportunity of making comparisons between each; and, as was explained to him, for ordinary purposes they could produce by the old-fashioned puddling process iron which would successfully compete with that produced by any process extant.

Congratulations were offered to Messrs. Thomas and Gilchrist upon the wonderful scientific and commercial success which their process had achieved by Mr. Stead; and Mr. J. G. Wright asked for figures as to the comparative cost of the process as compared with the old Staffordshire puddling. Mr. Gilchrist, in reply, said the figures he would quote were true for Staffordshire, South Wales, and Scotland. These showed that the cost, including waste and the price of the pig, was 7*4s.* 11*d.* per ton by puddling, and 6*9s.* 8*d.* by the Basic-Bessemer process. Mr. J. Solly (Tipton) remarked that he was quite satisfied that the metal produced by the process was admirably adapted for sheets and other purposes. Mr. Hickman, replying to some remarks, said he had no anxiety on the subject of tap cinder getting scarce as this process became developed. He pointed out that if the basic material was rolled it became as fibrous as any iron, and that the same thing applied to the question of tensile strain. Mr. C. Chambers (Brierley Hill) asked, if it entailed considerable cost in labour and waste to work up ingots into bars, what better position would they stand in by making ingot iron than in making puddled bars in the present way? Mr. W. Farnworth (Swindon) said in Germany he had found what Mr. Gilchrist said to be correct, but it struck him that it suited the purpose of the Germans to use the process more so than in England, because they did not get pigs so suitable for puddling as they did in England, or which was so suitable for the Bessemer process, hence the reason why the Germans imported such large quantities of hematite pigs. Mr. Gilchrist, replying to the questions and arguments of the different speakers, said he thought that there was plenty of room to make steel from phosphoric pig as well as puddled iron, if they only used the former for sheets and plates generally. One was led to admit that this material required less heat to make a satisfactory weld than puddled iron.

TRADE OF THE TYNE AND WEAR.

Nov. 19.—The Steam Coal Trade is very quiet at present; there is some uncertainty as to what course the men will take about the sliding-scale, the offer of the masters, to give an advance of 2½ per cent. whether the arrangement under the sliding-scale would give an advance or not, is certainly very fair. Up to the present it has not been ascertained that the whole of the balloting papers have been returned, and the result will not be made known for a few days. This uncertainty causes the trade to languish to some extent. There is still a fair demand for this coal from France, the Mediterranean, the East and West Indies, and the Sound ports. Some large Dutch East Indiamen are expected shortly from the Java ports; steamers still continue to run to the countries in the North of Europe. It is premature yet to say much about contracts for steam coal; one of the best gauges for the trade are the requirements of the North-Eastern Railway Company for locomotive purposes. The prospect of local trade over the winter continues good. It is rather probable that the directors of the railway company, fearing an advance of coal prices, will require quarterly or six month contracts instead of monthly contracts. This will test the question of price. Contracts for small steam coal continue to be made at increased rates. This coal is coming largely into use for steamers. Most of the collieries in Durham continue to be well employed; there is a good demand for gas and coking coal, and prices are well maintained. The Stella Coal Company have acquired the Blaydon Main Colliery, which has been worked many years by the late Mr. G. H. Ramsay. A good coking coal is produced here, and the fire-clay beds are converted into excellent fire-bricks and other fire-clay goods. Coal shipments have not been so large during the past week, but as the weather is now moderate they are likely to increase.

The house coal trade in Durham fluctuates a little, but there is a fair demand for home consumption, and for the London and other markets. A very general state of prosperity continues to exist in the industries of those rivers with respect to shipbuilding and engineering trades; the prospect for next year is exceedingly good. Shortly after the new year the engine-works at Walsend will be in full operation. Many new shipbuilding works have been commenced lately on the Tyne, and others will shortly be started. The erection of the swing bridge at Newcastle has given a great impetus to general trade above bridge, and it has rendered possible the opening of shipbuilding yards at Scotswood, and it has given great facilities for business at the great works at Elswick, where shipbuilding will be commenced shortly by the new company formed. The Armstrong-Mitchell Company has been received with great favour, and all the shares were rapidly taken up. Improvements continue to be effected in the River Tyne. At Walker the point which obstructed the navigation much there has been nearly all removed, and above bridge the island known as the King's Meadows is being rapidly removed. The Coble Dean Dock is also nearly completed on the north side of the river, and when this is fully opened it will greatly facilitate the export and import trade of the Tyne. At Blyth the improvements in the harbour and shipping places are making fair progress; the shipment of steam coals will be considerably increased at this port during the next year. At Amble Messrs. Smith and Co., who lately purchased the Radcliffe Colliery, are making considerable progress in the improvement of their shipping places, which have been enlarged and deepened by blasting the rocks. When those works are completed the whole of the produce—coal, fire-bricks, &c.—turned out here will be shipped at Amble. Hitherto a considerable part has been shipped on the Tyne at a considerable cost for railway carriage.

The pig-iron trade has been very flat this week, and the demand has been restricted. The makers have not been selling now. Some business has been done by merchants, whose quotations have been 6*d.* per ton below the makers. They have, however, only been selling small quantities. It is expected that there will be an increase in stocks this month, which is in strong contrast with the results in the last two months, when there were unprecedented reductions. The makers are determined to maintain the late quotations. Most of them are sold to the end of the year, and it is expected that the new year will see increased rates. The manufactured iron trade continues quiet, but there is no change in prices. The question of restricting the make of plates is still being considered. One large firm is, however, opposed to the arrangement. There is plenty of work at the finished ironworks, but prices are far from remunerative. The rates at present are—Ship-plates, 6*l.* 12*s.*; bars, 6*l.* 5*s.*; angles, 6*l.* Pig-iron No. 3 is 43*s.* 6*d.* to 43*s.* 7*d.* Messrs. Connal's stock is 100,861 tons, 680 tons less than last week. The ironworkers, it is hoped, will accept loyally the 5 per cent. reduction awarded by Sir Joseph Pease. The shipments of pig-iron for the week amount to 18,434 tons, and shipments for the month so far 53,000 tons. Heavy shipments of steel rails continue to be made, a cargo of 1436 tons has been sent to Naples, 1000 tons to Baltimore, and a 1000 tons to South America.

CHANNEL TUNNEL.—On Saturday week a number of the mem-

bers of the North of England Institute of Mining and Mechanical Engineers paid a visit to this tunnel. Several scientific gentlemen also accompanied the members of the Institute. Subsequently the visitors inspected the compressed air locomotive of Col. Beaumont, which appears to be admirably adapted for working tunnels of great length. They also witnessed a series of blasting operations on a principle calculated to render the working of coal mines more safe. At a luncheon which followed, Sir E. Watkin said he trusted that the Board of Trade would allow the works to proceed. Mr. Cowan, M.P., said the fear of the tunnel being dangerous to England was chimerical; the tunnel, when completed, would greatly benefit and increase our Eastern trade.

ARBITRATION IN THE IRON TRADE.—Sir Jos. Pease's award in this case is to the effect that the operatives in the manufactured iron trade have not made out their claim for an advance of wages. The employers claimed a reduction of 7½ per cent., and Sir Joseph has awarded a reduction of 5 per cent. The award will, no doubt, disappoint the ironworkers; but, as they accepted the arrangement that Mr. Pease should decide the important question, they are bound to accept it and abide by it. It will be recollected that early in the year the workmen obtained an advance of 7½ per cent. above what the sliding-scale gave them. Sir Joseph Pease gave them 5 per cent. addition in two portions. His award now takes off the 5 per cent., but the men in the North will still have a wage above what the late sliding-scale would have given them.

REPORT FROM DERBYSHIRE AND YORKSHIRE.

Nov. 30.—There is not much that is new to report with respect to mining operations in Derbyshire, seeing that the miners have been working steadily in the coal district since the advance of wages was conceded. As to the lead miners, they are far more reasonable and contented than those engaged in coal getting, although their wages are probably not much more than what is obtained by the colliers. With respect to the latter some meetings have been held for the purpose of getting them to agree to reduce the output of coal, and a delegate has been appointed to attend the Congress which is to take place next Tuesday at Leeds for the discussing of the best means for carrying out that object. It is, however, doubtful if the men will agree to restriction, seeing that it really means a reduction of wages to a point below what they were before the advance was given. But the agitation has not had the same effect as that with respect to the wages, for merchants do not show the same avidity as to purchasing. Transactions in house coal with the Metropolis are comparatively moderate to what they have been; but prices to consumers have not declined, although colliery owners in some instances have been obliged to submit to some reduction. To the Eastern Counties a fair business has been done in the Black Shale as well as in other descriptions of soft coal. In steam coal there has been no material change, the great part of what is raised being absorbed by the ironworks and railway companies, not much being exported. In engine coal a moderate business continues to be done, whilst a good deal of gas fuel is being sent away southwards. The iron trade keeps well up, there being a steady demand for pig for both Staffordshire and Lancashire, in addition to the large quantity that is required for the local foundries. Staveley and Stanton still maintain the lead in the county, while the Sheepbridge Company have also been turning out a heavy tonnage of pig. The foundries have been fairly employed, but there has not been any marked improvement with respect to finished iron.

As Christmas draws near work in Sheffield becomes more intensely active, and already the men at many places are putting in a good deal of overtime. The production of ordinary pig in the district is by no means large, the Parkgate Company turning out more than all the other works in the district. A good deal of bar and similar iron is obtained from other districts, Derbyshire furnishing a considerable quantity from the Butterley Works. Hematite iron for Bessemer and crucible steel has also to be imported in large quantities, for at probably no previous period have the requirements been so heavy. In armour-plates the Atlas and Cyclops Works have as much as ever they can do, there being large contracts in hand. The composite plates, it appears, have been found to have a greater resisting power than an equal thickness of steel, so that there is every likelihood that our Sheffield makers have as much as ever they can do in them during the next two or three years. A considerable business is also being driven in ship-plates, although more is now being done in this branch in the North of England than has been the case before, and increased plant is being put down for their production. Makers in the North of England have the great advantage of being close to extensive ship-yards, so that they are able to take contracts at a lower rate than those in Sheffield, who have to pay a heavy railway rate. The Bessemer departments are, perhaps, busier than they have been during any previous part of the year, there being a good enquiry for billets, whilst the rail-mills are also fully employed. Other descriptions of railway material, including levers, axles, points, and springs, are in steady demand. In cutlery of most kinds business is brisk, and the men are working well, more especially as regards the finest qualities of table and fancy pocket knives, although prices have gone up lately. Crucible steel has been going off much better of late, for in addition to what is required for cutlery purposes, a considerable tonnage is being sent away, whilst more is now required for tools of various kinds, as well as for wheels and axles. In files, saws, and edge tools a steady business continues to be done, and the same may be said with respect to mining tools. At the foundries the men continue to be fairly employed, but there is no push in any direction, heavy castings for machinery being amongst the largest products.

TRADE IN SOUTH WALES.

Nov. 30.—The shipments of coal have been interfered with, to some extent, by the weather at all the South Wales ports, those from Cardiff having fallen to 86,081 tons foreign and 16,324 coastwise; Newport, 24,778 tons foreign and 15,604 coastwise; Swansea, 19,607 tons foreign and 6419 coastwise. Prices are firm, at from 9*s.* 3*d.* to 11*s.* 6*d.* per ton; but good colliery-screened may be had at 11*s.* The patent fuel trade is active, and there is a good demand. Swansea sent away 7825 tons, and Cardiff 4986 tons. The price is from 11*s.* to 11*s.* 6*d.* per ton.

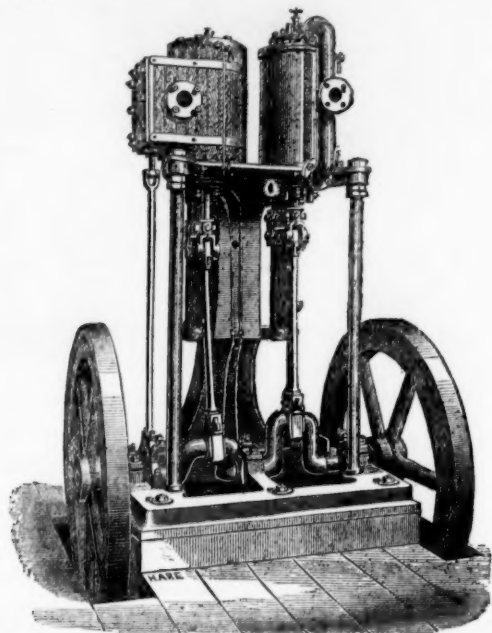
A portion of the steelworks at Cyfarthfa will be set going early in the new year, and merchant iron bars will be turned out in the first instance. On the 23rd ult. the problem of "rolling off" an ingot straight from the Bessemer pit was, by the aid of the soaking pit process, satisfactorily solved at the Tredegar Steelworks. The *modus operandi* in all other steelworks in Wales is as follows:—The molten steel is poured from the "converter" into moulds, and, when the metal is sufficiently chilled, the ingots are removed and put into stock; they are then taken as required to the balling furnaces and re-heated—an expensive, and, as proved by the Tredegar Company, unnecessary process—and from the re-heating furnace to the cogging rolls, again to the re-heating furnace, and thence to the finishing rolls. By the new process the ingot is taken from the mould immediately the metal has been sufficiently chilled to allow it to adhere and retain the form of an ingot, and placed in a brick-lined pit, large enough to contain the ingot and allow the gases which exude from it to envelope it; a plate is then placed over the pit, which thereby keeps the gases in and prevents the air getting near the ingot. After remaining in the pit for some 25 minutes, it is found that the initial heat of the centre of the ingot, which, when taken from the mould, is still in a molten state, has spread itself all over the ingot, and the piece of metal which, when put into the pit, only appeared to be cherry-red hot, has, by its own recuperative powers, and apart from any extraneous aid, become a glowing white mass, and is passed direct through the cogging and finishing rolls—metal which was run from the converter only 40 minutes before appearing in the form of a rail 90 ft. long.

The amount of iron sent away from Cardiff last week was 4928 tons, and 4201 tons were sent away from Newport. Of iron ore thus arrived at Cardiff from Bilbao 6690 tons, and 5729 tons from other places; Newport received 6787 tons from Bilbao, and 3115 tons from other places. The price stands at from 15*s.* 3*d.* to 15*s.* 6*d.* per ton.

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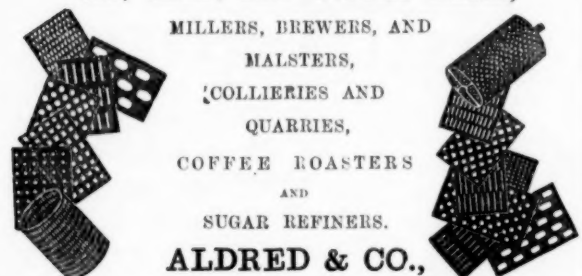
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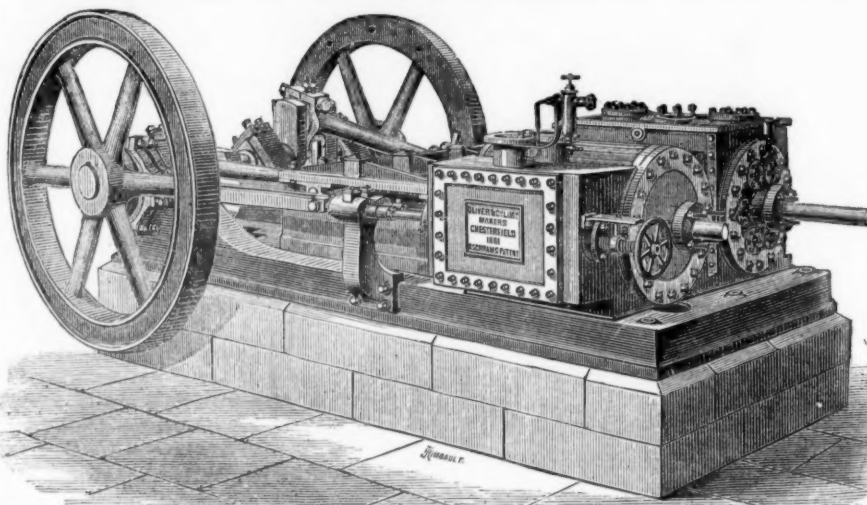
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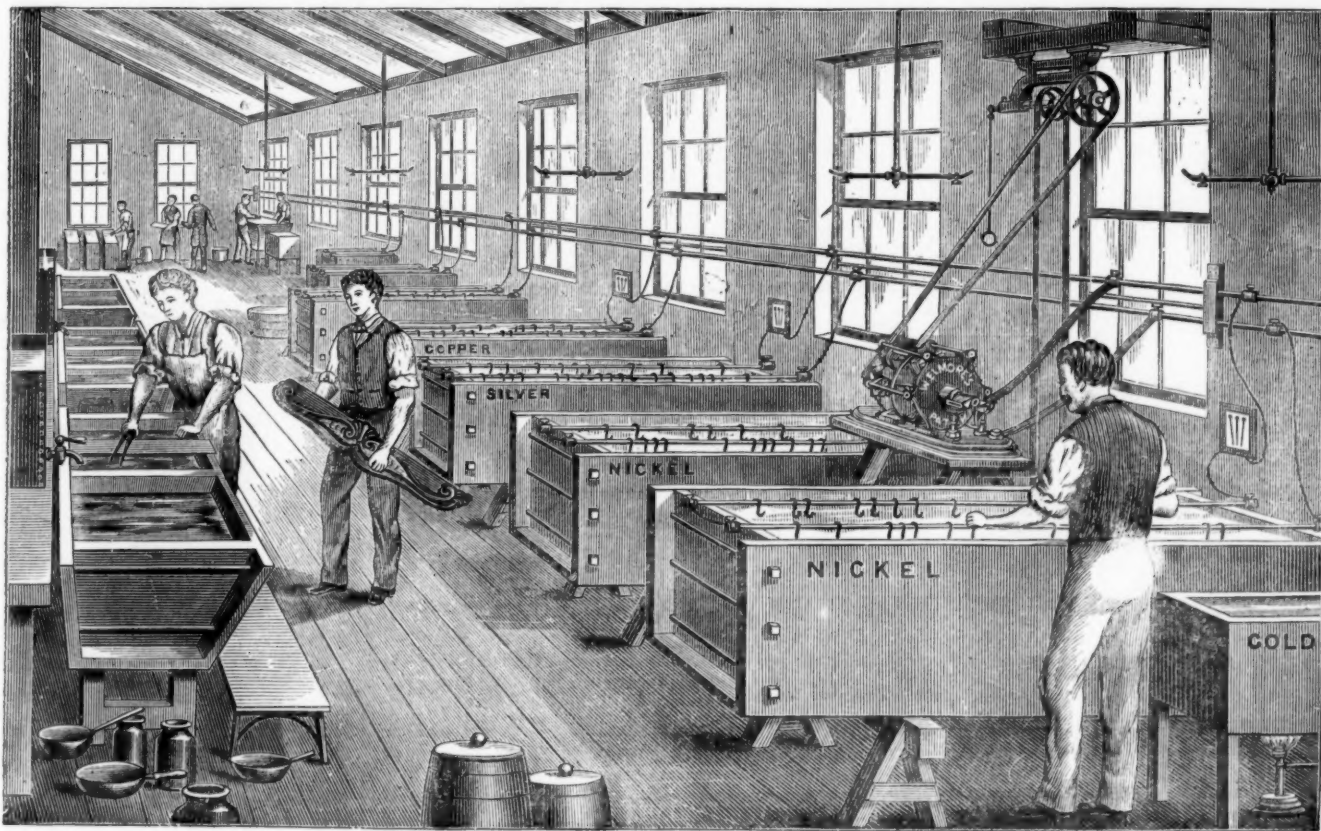
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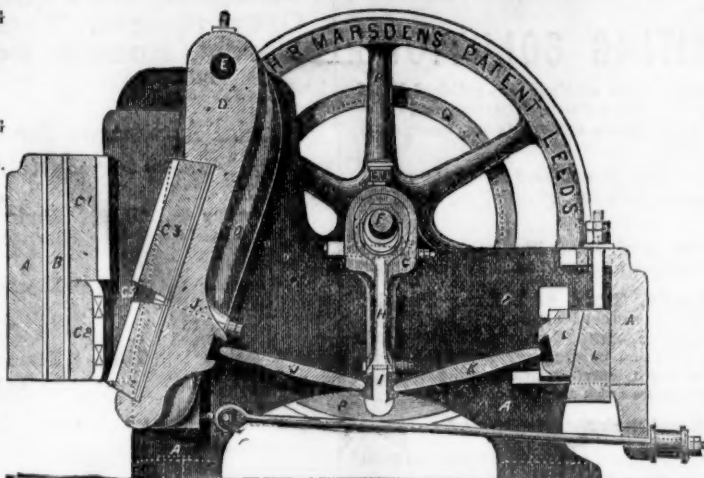
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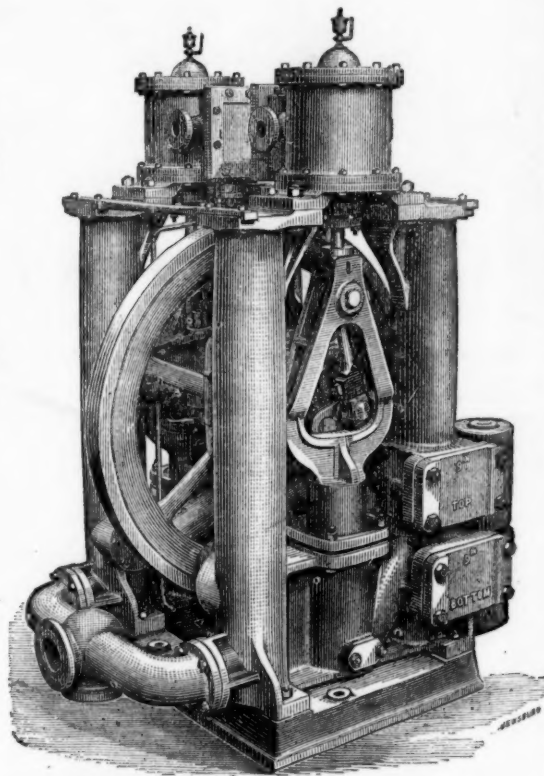
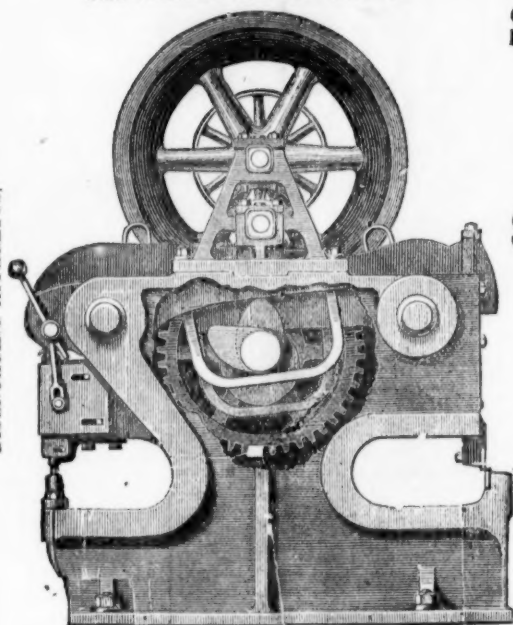
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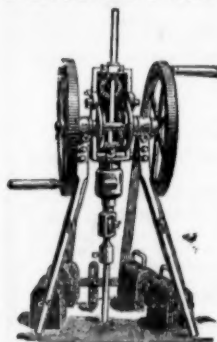
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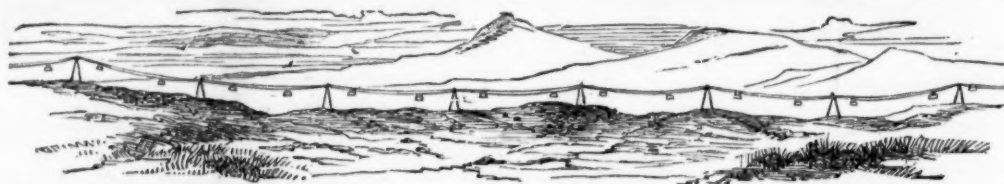
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